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ABSTRACT

This study to identify the verbal behaviors of librarians and library users that facilitate or impede information exchange in presearch interviews for computer-based literature searches was part of a larger research project that gathered data on 80 presearch interviews in seven medical libraries. The project also sought (1) to identify nonverbal behaviors of requesters and search intermediaries: (2) to identify tasks that are accomplished by the librarian to facilitate information exchange: and (3) to objectively code videotaped presearch interviews in terms of the extent to which those tasks were accomplished. Chapters review the literature related to the analysis of verbal behavior, describe the methodology of the study, report the findings, and discuss their implications. A bibliography lists more than 30 references. (FM)

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VERBAL BEHAVIORS OF LIBRARIANS IN PRESEARCH INTERVIEWS

by

Wayne W. Crouch

April 1981

A report of the Presearch Interview Project
(NLM Grant No. 1 R01 LM03074)

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LIST OF REPORTS OF
THE PRESEARCH INTERVIEW PROJECT
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Date	Title	Author(s)
Feb. 1, 1980	Progress Report for May 1, 1979 to January 15, 1980	Crouch and Atherton
March 7, 1980	Codebook and Frequency Distributions for Quantifiable Data	Tessier and Fargnoli
July 4, 1980	Analysis of Verbal Behaviors in the Presearch Interview: Codebook with Instructions for Transcribing Interviews	Crouch and Lucia
April 1981	Descriptive Account of Stimulated Recall Sessions with Requesters that Followed Presearch Interviews	Wargula, Lucia and Fargnoli
April 1981	Satisfaction Measures in Presearch Interviews	Tessier
April 1981	Verbal Behaviors of Librarians in Presearch Interviews	Crouch
April 1981	Nonverbal Behaviors in Presearch Interviews	Genova
April 1981	Tasks Performed by Online Searchers in Presearch Interviews	Cochrane
May 1981	Executive Summary, Project Bibliography, and Sample Data	Cochrane

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*This appendix could not be included in this version of the report, but is available upon request. Please write to PIP Archives, Syracuse University, School of Information Studies, 113 Euclid Ave., Syracuse, NY 13210.

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I. INTRODUCTION

A. Description of the Research Problems and Previous Related Work

The purpose of the research reported in this paper was to identify verbal behaviors of librarians and library users that facilitate or impede information exchange in presearch interviews for computer-based literature searches. In addition, the research approach included the development and testing of an objective method for describing the verbal behaviors of librarians and users. That purpose was chosen for the project because of the central role of the interview in computer-based literature searching.

Librarians have long identified communication with users in general, and the skilled conduct of the reference interview in particular, as vital aspects of library service. An early mention is made by Wyer (1930), and regular treatment of the topic is found in the professional literature of the past 10 to 20 years. Crouch (1979) provides a comprehensive bibliography and an analysis of that literature.

Computer-based literature searches are a recent addition to library services that require increased communication between librarians and requesters*, frequently in the form of the presearch interview. We view such searches as complex interactions among, minimally, requesters, information retrieval systems, and databases. But in addition, librarians have increasingly found

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*Since library users in this study are always in the role of requesting a computer-based literature search, we refer to them as "requesters."

themselves serving as intermediaries conducting presearch interviews. This role has become an indispensible part of the search process because, among other reasons, (1) requesters frequently find it difficult, or impossible, to translate their needs into the form required by the retrieval system; (2) requesters are not willing to spend the time necessary to do a search; (3) requesters are unwilling to learn how to use the system because they seldom need to; and (4) requesters are not up to date on changes in system characteristics and databases (Marron and Fife, 1976). Thus, many requesters obtain computer-based literature searches only by conferring with a librarian or by sending a helper to confer. Either way the intermediary has become an important link between the requester and the information retrieval system (Lancaster, 1974; Bennett, 1972; Martin, 1973).

As online retrieval systems have grown in importance, descriptions and evaluations of their use for literature searches and other functions have also increased (Lancaster and Fayen, 1973; Marron and Fife, 1976; Swanson, 1975; Debons and Montgomery, 1974; Summit and Firschein, 1974; Martin, 1973; Bennett, 1972; Brandhorst and Eckert, 1972; Wanger, Cuadra, and Fishburn, 1976). The results of the computer-based search, for instance, have been extensively studied. The widely used and well-known criteria of precision and recall (as aspects of relevance) were originally used at Cranfield as objective measures of topic relatedness between retrieved documents and the topic searched (Cleverdon, 1974). Since then, requesters have been used as judges themselves and a number of authors, including Kemp (1974) and

Saracevic (1975), have commented on the nature of this more subjective form of relevance. The notions of "utility" (Cooper, 1973) and "novelty" (Lancaster and Fayen, 1973) are more recent examples of concepts suggested as measures of the results of the search. Studies have also described online user behavior (Penniman, 1974, 1975), utilization (Tagliacozzo, 1975), and the sequence of the events within the librarian and requester interaction (Briggs, 1975).

However, few studies have concentrated on the interaction between librarians and requesters. Some that have are Luck (1976), Jahoda (1974), Chalmers (1975), and Briggs (1976). However, even the UCLA-Georgia study (reported by Briggs) which analyzed the dialog between user and librarian prior to developing an S.D.I. profile does not tell us much about the interaction as an interpersonal communication phenomenon. Since talking is the main focus of attention for the requester and the librarian, that talk, or verbal behavior, seems to be a promising topic for research.

Thus, the interview is worthy of study because it is the only link between the requester and the retrieval system, making complete and accurate information exchange crucial for a successful search. And, since talk is the primary channel of interactive information exchange in the interview, it was chosen as the focus for this research.

B. The Presearch Interview Project

This work is one of five related research efforts of the Presearch Interview Project. The entire project will be briefly described below. A more complete description is contained in the final report for the project (see list of project reports at the end of this report).

We view information exchange as the primary purpose of the presearch interview. The librarian must find out enough about the information needs of the requester to attempt to meet them by using a computer-based literature search service. The requester must find out not only what the librarian needs to know in order to perform the best possible search, but also something about how the system works, charges, delivery time, etc. Since the information need can only be met through the librarian, information exchange during the presearch interview is critical.

The purpose of this project as a whole is to objectively indicate the adequacy of information exchange in the interview and show what behaviors and tasks performed by the librarian can affect the ultimate success of the search. We expected to be able to identify important reactions of the requester to the presearch interview itself, and we felt that the presearch interview is a human encounter of which the requester is very aware and which can affect the requester's subjective evaluation of the computer-based literature search service as a whole.

The entire project involved this research, a task analysis (Cochrane, 1981), a description of requester comments in a

"debriefing" discussion (Wargula and Lucia, 1981), an analysis of nonverbal behaviors (Genova, 1981), and an analysis of requester satisfaction with the interview (Tessier, 1981). Extensive demographic and situational data were also gathered.

The data that are important for this research are (1) the videotape recordings of presearch interviews that were made, the transcription of them, and finally, the objective coding of the verbal behaviors of the librarians; (2) the measures of requester satisfaction; (3) the audiotapes of "debriefing" sessions with requesters and librarians; and (4) some of the demographic and situational data. All of that is discussed in more detail in the section on methodology later in this report.

C. Brief Review of the Literature Related to the Analysis of Verbal Behaviors.

The unique focus of the study reported here is the verbal behaviors of the librarians and the library users. The other data is shared with the other studies in the project, and all studies are briefly reviewed in an executive summary.

For this study, various research literature relevant to the study of verbal behaviors was examined, several approaches were identified, and one was chosen as most promising for meeting the objectives. This part of the report briefly describes what was found in the literature. A more detailed description of the development of the verbal behaviors coding scheme is given in Section II.

We do not know of any previous attempts to objectively

code verbal behaviors--the way the interactants talk--in pre-search interviews or library reference interviews. However, the topic has been given considerable attention in more general settings by scholars in numerous fields, including communication, psychology, and sociology. a good introduction to this breadth is given by Jacobs (1980) in a book review essay, and an excellent review of selected coding schemes can be found in Rogers and Farace (1975).

The objectives of this study required that an approach be found that would allow objective coding and that would relate the verbal behaviors to requester and librarian satisfaction. The approaches given the most scrutiny were ones by Hawes, Rogers and Farace, and Dethman.

Hawes (1972a) described a coding system which was based in part on a system called Sequential Analysis of Verbal Interaction (SAVI) by Simon and Agazarian (1967). He found that conversations could be reliably coded and that consistencies in patterns of communication could be documented (Hawes, 1972a). No direct link was made between verbal behaviors and participants' subjective reactions to the interview, but verbal behaviors generally labeled "indirective" led to more psychological information being exchanged in doctor-patient interviews. Verbal behavior generally labeled "directive" led to more physiological, impersonal information being exchanged (Hawes, 1972b).

In Hawes' scheme, verbal behaviors were coded every 10 seconds during the interview as one of 13 types. Whether the

doctor or patient was talking was not recorded. Examples of the categories are "generalizing" (statements referring to or analyzing a situation in abstract and impersonal terms), "objective" (messages reporting factual or verifiable information), and "subjective questions" (queries soliciting information about the other's physical and psychological condition).

Rogers and Farace (1975) describe a relational coding scheme which is described in more detail in an undated coding manual by L. Edna Rogers-Millar. The scheme is also described in a report of its use (Rogers-Millar and Millar, 1979). It was developed primarily for coding talk between marriage partners and is explicitly designed to capture the relational definitions that emerge. The participants are seen as taking "turns" in the conversation and each turn is coded as to "format" and "response mode." These codes are then transformed to one of three types of "moves": one-up, one-down, or one-across. It is the series of "moves" that is of interest for further analysis.

The system provides a description of the conversation over time and research using the system has focused on this "process" view of verbal behaviors.

Dethman (personal communication*) developed a coding scheme that is based on "control tactics" in conversations. She sees a conversation as consisting of potentially overlapping contributions by both participants. Each contribution can exhibit one or all of various tactics that she defines.

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*Linda Dethman, doctoral candidate, School of Communication, University of Washington, Seattle.

Examples of tactics include "an agreement," "a disagreement," "giving factual information," "restatement," and "suggestion of compromise."

The scheme provides a description of the conversation over time and is thus amenable to an analysis of "process." However, Dethman summed the number of occurances of each tactic, then used the scheme to provide summary measures of the entire interview or parts of it.

Other coding schemes and underlying theory were considered for use, but none as thoroughly as these. An adaptation of the Dethman scheme was chosen; how and why is explained in Section II.B. below.

II. METHODOLOGY

This section provides an overview of all the data gathered for the Presearch Interview Project, a description of how the coding scheme for verbal behaviors was developed, a description of coder training and coding procedures, and a description of the data obtained by coding 70 interviews.

A. Overview of Data Gathering for the Presearch Interview Project (PIP)

Seven libraries were chosen as sites for gathering data. Two were located in medical centers, two in medical colleges, one in a specialized hospital (Veterans Administration), and two in city hospitals. The number of librarians who partici-

pated in the study at a site varied from one to six; in total, 19 different librarians participated.

A total of 82 interviews were videotaped. The following listing shows the various types of data that were obtained and that are relevant to this study.

Type of Data	N
Videotapes of the interviews	82
Situational information (such as, was a terminal used in the interview)	82
Measures of requester satisfaction with the interview (questionnaire)	80
Measures of librarian satisfaction with the interview (questionnaire)	82
Audiotape of a "debriefing" interview with the requester	67
Audiotape of a "debriefing" interview with the librarian	18
Demographic data for users (questionnaire)	81
Demographic data for the librarian (questionnaire)	19

The procedure at each library included gathering the above data and some additional data used for other studies in the project. The procedure was:

1. Explain procedure to librarians and obtain their signature on permission forms.
2. Meet requester and obtain signature on permission form.*

*Most requesters came for an interview by appointment knowing that videotaping and other research activities would take place.

3a. Videotape interview.
b. Record situational data (e.g., was a terminal used?).

4a. Librarian fills out satisfaction questionnaire.
b. Requester fills out satisfaction questionnaire and demographic data questionnaire.

5. Requester participates in "debriefing" interview.

6. Repeat #2-5 for all interviews.

7. Each librarian participates in "debriefing" interview for 1-3 interviews. (Librarians that were videotaped in more than three interviews were not debriefed for all of them.)

8. Each librarian fills out a "task analysis" questionnaire and a demographic data questionnaire.

The videotapes of all interviews and the audiotapes of all "debriefing" sessions were transcribed in full. The quantifiable data (situational information, satisfaction measures, and demographic data) were stored in computer files and documented in a project report (Tessier, 1980).

The interviews videotaped included a wide variety of types of medical library requesters and topics. Most (69) did not include the use of a terminal to actually do the search during the interviews. The search was done later. Thirteen interviews did include the use of a terminal and are studied in an exploratory way.

The development of the satisfaction measures is described and an analysis of the satisfaction data is given in a project report by Tessier (1981). Nine individual measures were used. The form used with requesters is shown in Table 1. The wording of the introduction was changed for the form used with librarians. Responses were scored from 1 to 7 on each measure

Table 1. Satisfaction Questionnaire for Requesters

The purpose of these questions is to obtain your opinions about your interview with the search analyst. Please indicate the degree to which you agree or disagree that each statement describes YOUR interview. Use the fourth or middle position to represent "neutral"; then moving out from the center, "slight" agreement, "moderate" agreement, and finally, "strong" agreement.

1. I enjoyed working with the search analyst.

strongly agree							strongly disagree

2. The interview was very helpful to me.

strongly agree							strongly disagree

3. I was very dissatisfied with the interview.

strongly agree							strongly disagree

4. The search analyst understood my request when the interview was finished.

strongly agree							strongly disagree

5. Generally, it was not a successful interview.

strongly agree							strongly disagree

6. I expect the online search to be highly successful.

strongly agree							strongly disagree

7. I felt ill-at-ease during the interview.

strongly agree							strongly disagree

8. The search analyst understood my purpose for requesting a computer search.

strongly agree							strongly disagree

9. The interview fell short of my expectations.

strongly agree							strongly disagree

where 7 was the end of the scale which indicated a positive response to the interview.*

A factor analytic study of requester responses to the nine satisfaction measures identified four factors or indexes of satisfaction:

A. Focus on search results/information/problem
   Measure 6: Expect online search to be successful

B. Librarian understanding
   Measure 4: Searcher understood my request
   Measure 8: Searcher understood my purpose

C. The interview seen as an event
   Measure 5: Not a successful interview
   Measure 7: Ill-at-ease
   Measure 9: Fell short of my expectations

D. Interview comfort
   Measure 1: Enjoyed working with searcher
   Measure 3: Very dissatisfied with interview

The individual measures and the indexes will all be considered in this study.

Audiotapes of the "debriefing" sesions with both users and librarians were studied as part of the procedures for developing a coding scheme for verbal behaviors. Their impact is described in a later section on that procedure.

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*Strongly agree was at the "7" end for Measures 1, 2, 4, 6, and 8. Strong disagree was at the "7" end for Measures 3, 5, 7, and 9.

B. Development of the Verbal Behavior Coding Scheme

The three coding schemes previously described were reviewed in detail for possible use in the project. Two criteria were applied in choosing one to use or adapt. First, the coding scheme was to be objective. It should, at least, have high intercoder reliability among coders trained for this project. And, it would preferably also have high intercoder reliability among coders trained by different investigators on the basis of the written codebook. The former is checked as a part of the research reported here, but testing the latter was not included in this project.

The chosen coding scheme was also to have a maximum likelihood of identifying verbal behaviors that relate to requester and librarian satisfaction with the interview. These approaches were used to find such a scheme: (1) literature about various schemes and their uses was reviewed; (2) videotapes of the Presearch Interview Project interviews and audiotapes of the "debriefing" sessions with requesters and librarians were studied in detail; and (3) a consultant* with extensive background in the study of interviews was brought in to review project staff members' work in the two previous areas.

The bulk of the literature review was concentrated on the work of Hawes, Rogers and Farace, and Dethman, and is briefly described in a previous section. Hawes' scheme is objective, but the highly abstract categories of verbal

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*Dr. Leonard Hawes, Department of Communication, University of Utah, Salt Lake City, Utah.

behaviors did not seem promising for our purposes. His major finding that directive interviews produced physiological data, whereas nondirective interviews produced psychological or personal data, did suggest that we consider a similar distinction in the coding scheme chosen or developed for the project.

Rogers and Farace's scheme was developed for the analysis of conversations between married couples and is tied closely to Watzlawick's theories which emphasize a "symmetrical" and a "complimentary" nature of interaction. That theoretical basis did not seem particularly promising for the interview between a professional and a client that we were studying. Also, although the coding scheme is objective, the transformation from the original codes to the "one-up," "one-down," and "one-across" designations is based on theory and almost entirely untested as to its validity.

Dethman's scheme was also developed for conversations among people who would seem to be in quite a different situation than our subjects. She studied students discussing assigned topics. However, her categories seemed to be more promising and her approach to conversation as a series of potentially overlapping contributions was especially appealing. There seemed, however, to be a number of important verbal behaviors evidenced in our interviews that were not reflected in Dethman's coding scheme. Thus, her general approach was adopted and the videotapes of our interviews and the audiotapes of the debriefing sessions were examined further in order to revise and add categories to Dethman's scheme (see Table 2).

Table 2. Brief Descriptive Names for Dethman's Categories of Verbal Behaviors

From Dyadic Communication Study Codebook, Dervin & Dethman, 1973-74.

1. an agreement
2. requests agreement
3. a disagreement
4. positive statement about other or other's activities
5. negative statement about other or other's activities
6. positive statement about self, attribute of self, or how self does something
7. negative statement about self, attribute of self, or how self does something
8. gives factual information
9. requests factual information
10. gives opinion, reason
11. requests opinion, reason
12. restatement
13. request for restatement
14. request for clarification
15. a suggestion or order to other
16. use of "we" in giving suggestions
17. use of "you" in giving suggestions
18. requests suggestions/ order
19. acceptance of suggestions or order
20. suggestion of compromise
21. speaker suggests he might change position to agree with other
22. changes position to agree with other
23. self contradiction
24. an interruption
25. a finished thought of other
26. "I don't know"
27. question
28. laughter
29. number of filler words and phrases
30. number of repititions
31. number of incomplete thoughts
32. number of complete thoughts
33. number of words in contribution
34. object of contribution is "I"
35. object of contribution is "you"
36. object of contribution is "we"
37. topic change

The original examination of coding schemes was based in part on the detailed review of our interviews, as was the consultant's review of project staff members' work. Interviews were viewed by themselves and in conjunction with the associated debriefing sessions. Likewise, changes and additions to Dethman's coding scheme were the result of that kind of review.

The coding scheme that resulted is given in detail in Crouch and Lucia, "Analysis of Verbal Behaviors in the Presearch Interview: Instructions for Transcribing Interviews and Codebook." Table 3 lists the categories finally used, along with various "bookkeeping" data that were recorded.

C. Coder Training and Coding Procedures

Coding with the scheme requires a detailed understanding of the categories and the ability to keep in mind subtle distinctions. All coders for the project were college graduates. Each spent 2-4 hours studying the coding manual, then coded an interview and compared the coding with one done previously by one of the authors of the coding scheme. Discrepancies were discussed and the practice coding repeated on one, two, or three additional interviews, the number being determined by a sufficient decrease in discrepancies.

Coders then proceeded to code interviews without being checked, except that at about the third interview one of the authors also coded the same interview and a comparison was made. Some discrepancies were found at this point and

Table 3. Brief Descriptive Names for Categories in the Verbal Behaviors Coding Scheme*

1. Case #
2. Contribution #
3. Person speaking (0=silence, 1=librarian, 2=requester)

4. Silence (recorded as duration rounded to the nearest second)

5. Use of tool by the librarian (presearch form is not a tool)

6. Greeting or polite expression
7. Name of other (with or without title attached)
8. Title of other (without name attached)

9. # of occurrences of "I don't know"
10. # of words in contribution

11. Topic or subtopic change
12. Request for permission to change topic

13. Talkover that takes the turn
14. Talkover that doesn't take the turn

15. Verbal reinforcer

16. # of filler words or phrases

17. Reciprocated nervous laughter
18. Unreciprocated nervous laughter

19. Finishing the thought of the other

20. Evaluative statement about the interview

21. Description of what contributor is doing to understand the other
22. Statement that the contributor understands the other

23. Listing alternative actions for the other to choose among

24. Statement that the speaker makes the decisions
25. Statement that the other makes the decisions
26. Statement that the speaker and the other jointly make the decisions

27. Positive statement about the other or the other's activities
28. Negative statement about the other or the other's activities
29. Positive statement about self or how self does something
30. Negative statement about self or how self does something

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*Numbers 1,2,3,5,69,70 are not categories of verbal behaviors, but were recorded as part of the coding process.

Table 3 (continued)

31. Request for clarification of a contribution

32. Open question
33. Closed question

34. Greeting or suggestion in the form of a question

35. Factual information
36. Request for...
37. Acceptance of...
38. Nonacceptance of...
39. Agreement with...
40. Disagreement with...
41. Request for agreement with...

42. Personal information
43. Request for...
44. Acceptance of...
45. Nonacceptance of...
46. Agreement with...
47. Disagreement with...
48. Request for agreement with...

49. Opinion or reason
50. Request for...
51. Acceptance of...
52. Nonacceptance of...
53. Agreement with...
54. Disagreement with...
55. Request for agreement with...

56. Suggestion
57. Order
58. Request for a suggestion or order
59. Acceptance of...
60. Nonacceptance of...
61. Agreement with...
62. Disagreement with...
63. Request for agreement with or acceptance of...

64. Restatement or paraphrase
65. Request for...
66. Acceptance of...
67. Nonacceptance of...
68. Request for agreement with...

69. Videotape counter number

70. Coder number

discussion of them renewed the coder's understanding of the need for careful and thoughtful coding. Formal reliability measures were not taken at this time; however, agreement was high.

Ten cases with a total of 1,585 contributions were coded independently by two coders so that a formal intercoder reliability analysis could be conducted. That analysis is reported in the section on findings. Table 4 shows the number of interviews coded by each coder. Coder #1 is Lucia, one of the authors of the coding scheme. He did either the regular coding or the reliability coding for each case included in the reliability analysis. Thus, all reliability comparisons are between Lucia and Coder #4.

Table 4. Number of Interviews Coded by Each Coder

Coder #	Number of Interviews Coded	
	Regular	Reliability
1	24	4
2	5	
3	8	
4	27	6
5	6	
	70	10

D. Data Obtained

Eighty-two interviews were videotaped in the general data gathering phase. Of those, 12 had missing data, poor quality videotapes, or other special problems that made them unusable for this study. The 70 remaining interviews consisted of 11 in which a terminal was used during the interview to do the search, eight in which a terminal was not used and the librarian was male, and 51 in which a terminal was not used and the librarian was female.

The latter group was chosen for the main analysis because it was homogeneous in terms of no terminal used and the librarian being female. Table 5 lists the interviews studied. Librarian and requester sex is shown for each interview as are length and number of contributions which are discussed below.

The form of the data obtained for each interview is shown in its entirety on the sample coding sheets in the codebook, and coding procedures are described in detail in the text of the codebook. The data for one case are given in Appendix A of this report as an example. The format and procedures will be briefly reviewed here.

First, all statements and silences in each interview were assigned contribution numbers. Then, each contribution was coded on the 70 substantive or "housekeeping" variables (see Table 3). Thus, the data are values in an NCx70 matrix for each interview (where NC is the number of contributions in the interview). The NC contributions are represented by

Table 5. Interviews Included in This Study (n=51)

Interview Number	Librarian Sex	Requester Sex	Length of Interview (seconds)	No. of Contributions in Interview
101	1	2	234	53
102	1	2	591	155
103	1	2	195	45
104	1	2	135	45
201	1	1	248	57
202	1	2	117	24
203	1	1	206	34
204	1	2	253	41
205	1	1	219	60
206	1	2	115	20
303	1	2	178	44
310	1	2	192	42
401	1	1	565	114
404	1	1	214	49
408	1	2	151	34
413	1	2	792	125
414	1	1	235	43
504	1	2	813	107
505	1	1	1008	173
506	1	2	259	38
507	1	1	293	56
508	1	1	356	80
509	1	1	143	48
513	1	2	475	82
514	1	1	1351	206
515	1	1	828	156
517	1	2	248	61
601	1	2	962	215
602	1	2	533	104
603	1	1	1994	425
604	1	2	662	128
606	1	2	1184	237
608	1	2	600	122
609	1	2	462	113
611	1	2	360	51
612	1	2	1055	147
613	1	2	2027	474
614	1	2	448	66
615	1	1	1598	330
616	1	2	437	79
617	1	2	1055	234
618	1	1	901	168
619	1	1	901	166
701	1	2	437	115
702	1	2	821	177
703	1	2	513	102
704	1	1	812	190
705	1	1	1455	279
706	1	2	487	105
707	1	1	590	138
708	1	1	886	138

Table 5. (con'd)

Descriptive Statistics for Length of Interviews (in seconds):

Total Sample (n=70)		Sample Used in This Study (n=51)	
minimum	92	minimum	115
maximum	2027	maximum	2027
range	1935	range	1912
mean	612.12	mean	619.49
median	481	median	487
standard dev.	452.66	standard dev.	468.01

Descriptive Statistics for Number of Contributions in Interviews:

Total Sample (n=70)		Sample Used in This Study (n=51)	
minimum	20	minimum	20
maximum	474	maximum	474
range	454	range	454
mean	111.38	mean	123.43
median	81	median	105
standard dev.	88.25	standard dev.	96.84

rows, and the 70 variables by columns.

The data were stored in machine readable form in the APL files in an IBM 370 computer. The length of the interviews and the number of contributions for each case are given in Table 5. Also included are summary statistics for length and number of contributions. Statistics are also provided for the total set of interviews (n=70).

III. FINDINGS

A. Intercoder Reliability

Ten cases which included a total of 1,585 contributions were coded by two coders in order to assess how objective the coding scheme was. The 70 variables in the verbal behavior coding scheme are listed in Table 3. Five (1,2,3,69, and 70) were "housekeeping" variables and not categories of verbal behavior. Of the remaining 65 variables that were coded, two (11 and 12) were dropped during the coding phase because intercoder agreement was obviously very low, and one (4, length of silence in seconds) was not checked for intercoder reliability.

Coding of the remaining variables is evaluated in two ways. First, the correlations between the scores obtained for the ten cases by Coder One and the scores obtained by Coder Two were calculated. For continuous variables, four scores are of interest for each variable. They are:

SUM	The total number of occurrences in the interviews.
NCNZ	The total number of contributions with non-zero codes in the interview.
SUM ÷ NC	The number of occurrences per contribution (where NC is the number of contributions).
SUM ÷ NZNC	The number of occurrences per contribution when there was at least one occurrence in the contribution.

For dichotomous variables, only SUM and SUM÷NC are of interest. Table 6 shows these overall score correlations.

The second method of assessing intercoder agreement consisted

of calculating the extent to which the two coders agreed on their coding of each contribution. For continuous variables, this agreement is assessed by correlating the 1,585 codes of the two coders. This measure of intercoder agreement is also shown in Table 6.

For dichotomous variables, this agreement is assessed by calculating the number of times the two coders agreed as a percentage. There are four possible outcomes of two coders coding a dichotomous variable:

	Coder 1	Coder 2	Interpretation
(A)	1	0	Disagreement
(B)	0	1	Disagreement
(C)	1	1	Agreement on 1
(D)	0	0	Agreement on 0

Two measures of percent agreement are possible. The most obvious is (C+D)÷(A+B+C+D). However, when relatively rare events are being identified by the code of 1, agreement on 0 may not be meaningful. Thus, a more meaningful measure of percent agreement may be C÷(A+B+C). The latter is reported as Measure 1 in Table 6 and was generally used in this study as the most appropriate measure. The former is in Table 6 as Measure 2.

B. Variables Chosen for Further Analysis

Of the 70 variables listed in Table 3, most, but not all, were of substantive interest as discussed above. Table 7 lists all of the potentially interesting measures of verbal behavior that can be derived from the categories coded using

the statistics SUM, NC, and NCNZ. Many other measures could, of course, be explored, such as the ratio of open questions by the librarian to open questions by the requester or the ratio of open questions to closed questions by the librarian. Only the measures listed were pursued in this study.

The "verbal behavior category" number in Table 7 identifies the category in Table 3 from which the variables listed were derived. From here on in this report the term variable refers to one of these 139. Also given is the mean value for the variable and the reliability. The reliability measure used for continuous variables was the intercoder agreement correlation; for dichotomous variables, the measure used was intercoder agreement Measure 1.

These measures were used because they reflect agreement by the coders on individual decisions about contributions. The measures such as SUM and SUM÷NC are sometimes more reliable because individual coding errors cancel out. However, for that very reason they would seem to reflect an unwarranted trust in the variables.

To be eligible for further analysis, variables had to be reasonably reliable and they had to reflect verbal behaviors that occurred with sufficient frequency to be worthy of scrutiny. Figure 1 provides a visual representation of the dichotomous variables. Variables in the lower and left portions of the graph were excluded because they were either not reliably coded and/or they did not identify frequently occurring behaviors. The continuous variables all involved "frequent" behaviors and

were included or excluded based on the reliability measures. They are not shown in Figure 1. Fifty-seven of the 139 variables survived this elimination process.

The means given in Table 7 provide some information about the chosen dichotomous variables. Those means reflect librarian behaviors, requester behaviors, and silences for all 70 cases studied. The last two columns of this table compare librarians' and requesters' verbal behaviors for all of the 52 variables chosen. The variables with statistically significant relationships to satisfaction measures are noted with superscript a or b.

Table 6. Measures of Intercoder Reliability (for 10 cases, 1,585 contributions)

CONTINUOUS VARIABLES

Verbal Behavior Category No.*	Overall Score Correlations				Intercoder Agreement (Correlations)
	SUM	NCNZ	SUM÷NC	SUM÷NCNZ	
9	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	0.97
16	0.90	0.87	0.61	0.75	0.72

DICHOTOMOUS VARIABLES

Verbal Behavior Category No.*	Overall Score Correlations		Intercoder Agreement (%)	
	SUM	SUM÷NC	Measure 1	Measure 2
5	0.99	0.96	0.73	0.89
6	0.46	0.97	0.24	0.98
7	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00
13	0.94	0.40	0.57	0.96
14	0.99	0.96	0.84	0.97
15	0.99	0.95	0.71	0.95
17	0.67	0.71	0.12	0.99
18	-0.11	0.71	0.14	0.98
19	0.94	0.78	0.59	0.99
20	0.39	0.05	0.23	0.99
21	0.17	0.39	0.17	0.98
22	0.86	0.01	0.40	0.99
23	0.35	0.35	0.15	0.99
24	0.82	0.34	0.13	1.00
25	0.37	0.59	0.17	1.00
26	0.67	0.71	0.50	1.00
27	-0.01	-0.09	0.13	0.99
28	1.00	1.00	0.00	1.00
29	0.88	0.71	0.33	1.00
30	0.41	0.16	0.00	1.00
31	0.83	0.83	0.20	0.99
32	0.51	0.56	0.40	0.98

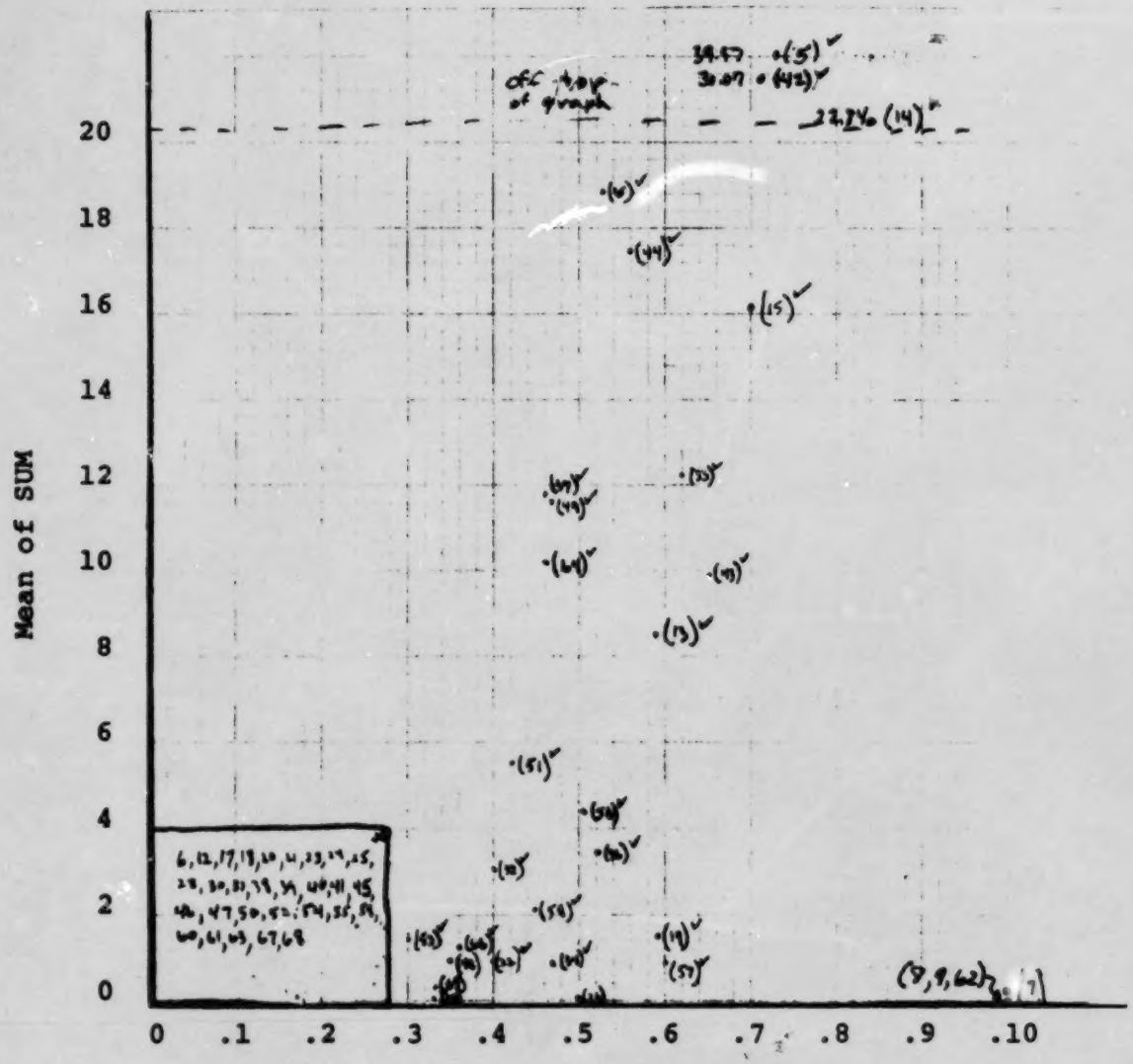
*See Table 3.

Table 6 (con'd)

DICHOTOMOUS VARIABLES (con'd)

Verbal Behavior Category No.	Overall Score Correlations		Intercoder Agreement (%)	
	SUM	SUM÷NC	Measure 1	Measure 2
33	0.98	0.94	0.62	0.95
34	0.53	0.95	0.47	0.99
35	0.99	0.69	0.53	0.89
36	0.72	0.49	0.51	0.99
37	0.97	0.68	0.46	0.92
38	0.72	0.74	0.13	1.00
39	0.49	0.17	0.15	0.97
40	1.00	1.00	0.00	1.00
41	0.04	0.11	0.07	0.97
42	0.99	0.75	0.71	0.90
43	0.95	0.69	0.65	0.96
44	0.97	0.61	0.56	0.89
45	0.16	-0.12	0.25	1.00
46	0.68	-0.01	0.23	0.98
47	1.00	1.00	0.00	1.00
48	0.90	0.62	0.35	0.99
49	0.74	0.71	0.47	0.93
50	0.04	0.19	0.10	0.99
51	0.87	0.60	0.42	0.96
52	1.00	1.00	0.00	1.00
53	0.53	0.36	0.30	0.99
54	1.00	1.00	0.00	1.00
55	0.25	0.50	0.18	0.99
56	0.99	0.91	0.51	0.97
57	0.95	0.80	0.60	0.99
58	1.00	1.00	0.00	1.00
59	0.89	0.70	0.45	0.98
60	1.00	1.00	1.00	1.00
61	0.22	-0.10	0.00	1.00
62	1.00	1.00	1.00	1.00
63	-0.16	-0.12	0.00	1.00
64	0.92	0.67	0.46	0.94
65	0.38	0.30	0.33	1.00
66	0.86	0.35	0.36	0.98
67	0.10	0.07	0.20	1.00
68	-0.01	0.11	0.13	0.99

Figure 1. Visual Presentation of the Criteria for Choosing Dichotomous Verbal Behavior Categories for Further Analysis



*So many categories fell in the area of this box, that each of their locations could not be shown. All of these were excluded from further analysis.

✓These categories were selected for analysis.

Table 7. Measures of Verbal Behaviors

Variable	Verbal Behavior Category No.*	Variable Type	Descriptive Name	Overall Mean** (n=70)	Reliability	Analyzed	Lib. Mean (n=51)	Req. Mean (n=51)
1	3	SUM÷NCNZ	Who talks the most	1.50	--	no	--	--
2	4	SUM	Amount of silence (in seconds) in interview	126.13	--	no	--	--
3	4	NCNZ	Number of silences in the interview	8.77	--	no	--	--
4	4	SUM÷NC	Amount of silence per contribution (seconds/NC)	1.23	--	no	--	--
5	4	SUM÷NCNZ	Average length of silences (in seconds)	11.42	--	no	--	--
6	5	SUM	Number of contributions during which a tool was used in the interview	39.97	.73	yes	18.31	15.69
7[b]	5	SUM÷NC	Proportion of contributions during which a tool was used	.28	.73	yes	.28	.24

[a]Significantly related to five Satisfaction Indexes (see Table 8).

[b]Significantly related to nine Satisfaction Measures (see Table 9).

*See Table 3.

**Overall mean does not equal the averages of librarian and requester means because some contributions were silences.

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
8	6	SUM	Number of greetings or polite expressions in the interview	1.83	.24	no	--	--
9	6	SUM÷NC	Number of greetings or polite expressions per contribution	.02		no	--	--
10	7	SUM	Number of times the name of a person (with or without title) was used during interview	.17	1.00	no	--	--
11	7	SUM÷NCNZ	Number of times the name of a person (with or without title) was used per contribution	.00		no	--	--
12	8	SUM	Number of times the title of a person (without name attached) was used during the interview	.00	1.00	no	--	--
13	8	SUM÷NCNZ	Number of times the title of a person (without name attached) was used per contribution	.00		no	--	--
14	9	SUM	Number of times the filler "I don't know" was used in interview	.00		no	--	--
15	9	NCNZ	Number of contributions in which the filler "I don't know" was used	.00		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
16	9	SUM÷NC	Number of times the filler "I don't know" was user per contribution	.00	1.00	no	--	--
17	9	SUM÷NCNZ	Number of times the filler "I don't know" was used per contribution	.00		no	--	--
18	10	SUM	Number of words in the interview	1166.67	.97	yes	657.06	509.30
19[b]	10	NCNZ	Number of contributions which were not silences in interview	102.56		yes	51.27	51.23
20	10	SUM÷NC	Length of contributions (average number of words/contribution)	10.43		yes	13.43	9.50
21	10	SUM÷NCNZ	Length of contributions (average excluding silences)	11.28		no	--	--
22	11	SUM	Number of topic changes in interview	--	--	no	--	--
23	11	SUM÷NC	Number of topic changes per contribution	--		no	--	--
24	12	SUM	Number of requests for a topic change in the interview	.04	.00	no	--	--
25	12	SUM÷NC	Number or requests for a topic change per contribution	.00		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
26[a]	13	SUM	Number of talkovers that took the turn in the interview	8.51	.57	yes	4.11	4.40
27[a,b]	13	SUM÷NC	Number of talkovers that took the turn per contribution	.08		yes	.08	.09
28[a,b]	14	SUM	Number of talkovers that did not take the turn in the interview	22.40	.84	yes	9.31	13.09
29[b]	14	SUM÷NC	Number of talkovers that did not take the turn per contribution	.19		yes	.16	.24
30	15	SUM	Number of verbal reinforcers in the interview	16.10	.71	yes	6.51	9.59
31	15	SUM÷NC	Number of verbal reinforcers per contribution	.13		yes	.11	.17
32	16	SUM	Number of filler words or phrases in interview	45.31	.72	yes	22.67	22.60
33[a,b]	16	NCNZ	Number of contributions that contained filler words or phrases in the interview	25.51		yes	13.24	12.13
34[b]	16	SUM÷NC	Number of filler words or phrases per contribution	.43		yes	.51	.43
35	16	SUM÷NCNZ	Average number of filler words or phrases in contributions with fillers	1.73		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
36	17	SUM	Number of incidences of reciprocal nervous laughter in interview	.66	.12	no	--	--
37	17	SUM÷NC	Number of incidences of reciprocal nervous laughter per contribution	.01		no	--	--
38	18	SUM	Number of incidences of unreciprocated nervous laughter in interview	.96	.14	no	--	--
39	18	SUM÷NC	Number of incidences of unreciprocated nervous laughter per contribution	.01		no	--	--
40[b]	19	SUM	Number of occurrences of finishing the thought of the other in the interview	1.51	.59	yes	.61	.90
41[a]	19	SUM÷NC	Number of occurrences of finishing the thought of the other per contribution	.01		yes	.01	.02
42	20	SUM	Number of evaluative statements about the interview in the interview	.76	.23	no	--	--
43	20	SUM÷NC	Number of evaluative statements about the interview per contribution	.01		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
44	21	SUM	Number of descriptions of what contributor is doing to understand the other in the interview	2.17	.17	no	--	--
45	21	SUM÷NC	Number of descriptions of what contributor is doing to understand the other per contribution	.02		no	--	--
46[a,b]	22	SUM	Number of statements that the contributor understands the other in the interview	.86	.40	yes	.29	.57
47[a,b]	22	SUM÷NC	Number of statements that the contributor understands the other per contribution	.01		yes	.01	.01
48	23	SUM	Number of times alternative actions for other to choose from were listed in interview	.94	.15	no	--	--
49	23	SUM÷NC	Number of times alternative actions for other to choose from were listed per contribution	.01		no	--	--
50	24	SUM	Number of statements that the speaker makes the decisions in the interview	.44	.13	no	--	--
51	24	SUM÷NC	Number of statements that the speaker makes the decisions per contribution	.00		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
52	25	SUM	Number of statements that the other makes the decisions	.06	.17	no	--	--
53	25	SUM÷NC	Number of statements that the other makes the decisions per contribution	.00		no	--	--
54	26	SUM	Number of statements that the speaker and the other jointly make the decisions in interview	.07	.50	no	--	--
55	26	SUM÷NC	Number of statements that the speaker and the other jointly make the decisions per contribution	.00		no	--	--
56	27	SUM	Number of positive statements about the other or the other's activities in the interview	.49	.13	no	--	--
57	27	SUM÷NC	Number of positive statements about the other or the other's activities per contribution	.00		no	--	--
58	28	SUM	Number of negative statements about the other or the other's activities in the interview	.03	.00	no	--	--
59	28	SUM÷NC	Number of negative statements about the other or the other's activities per contribution	.00		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
60	29	SUM	Number of positive statements about self or how self does something in the interview	.06	.33	no	--	--
61	29	SUM÷NC	Number of positive statements about self or how self does something per contribution	.00		no	--	--
62	30	SUM	Number of negative statements about self or how self does something in the interview	.10	.00	no	--	--
63	30	SUM÷NC	Number of negative statements about self or how self does something per contribution	.00		no	--	--
64	31	SUM	Number of requests for clarification of a contribution in interview	.66	.20	no	--	--
65	31	SUM÷NC	Number of requests for clarification of a contribution per contribution	.01		no	--	--
66[a,b]	32	SUM	Number of open questions in the interview	3.47	.40	yes	2.40	1.04
67[a,b]	32	SUM÷NC	Number of open questions per contribution	.04		yes	.06	.02

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
68	33	SUM	Number of closed questions in the interview	12.63	.62	yes	9.09	3.51
69[a,b]	33	SUM÷NC	Number of closed questions per contribution	.12		yes	.21	.06
70	34	SUM	Number of greetings or suggestions in the form of questions in the interview	.84	.47	yes	.66	.19
71[b]	34	SUM÷NC	Number of greetings or suggestions in the form of questions per contribution	.01		yes	.02	.00
72	35	SUM	Number of contributions containing factual information in the interview	18.80	.53	yes	11.37	7.41
73[a,b]	35	SUM÷NC	Number of statements containing factual information per contribution	.15		yes	.21	.13
74[a]	36	SUM	Number of requests for factual information in interview	3.53	.51	yes	1.87	1.66
75[b]	36	SUM÷NC	Number of requests for factual information per contribution	.03		yes	.03	.03
76	37	SUM	Number of statements containing an acceptance of factual information in the interview	11.87	.46	yes	4.91	6.96
77[a,b]	37	SUM÷NC	Number of statements containing an acceptance of factual information per contribution	.09		yes	.08	.11

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
78	38	SUM	Number of nonacceptances of factual information in the interview	.30	.13	no	--	--
79	38	SUM÷NC	Number of nonacceptances of factual information per contribution	.00		no	--	--
80	39	SUM	Number of agreements with factual information in the interview	1.86	.15	no	--	--
81	39	SUM÷NC	Number of agreements with factual information per contribution	.01		no	--	--
82	40	SUM	Number of disagreements with factual information in the interview	.14	.00	no	--	--
83	40	SUM÷NC	Number of disagreements with factual information per contribution	.00		no	--	--
84	41	SUM	Number of requests for agreement with factual information in the interview	1.33	.07	no	--	--
85	41	SUM÷NC	Number of requests for agreement with factual information per contribution	.01		no	--	--
86	42	SUM	Number of contributions containing personal information in interview	30.07	.71	yes	12.60	17.43
87	42	SUM÷NC	Number of statements containing personal information per contribution	.28		yes	.24	.37

Table 7. (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
88	43	SUM	Number of requests for personal information in interview	9.94	.65	yes	8.30	1.64
89[b]	43	SUM÷NC	Number of requests for personal information per contribution	.10		yes	.20	.03
90[b]	44	SUM	Number of acceptances of personal information in interview	17.54	.56	yes	10.16	7.37
91[a,b]	44	SUM÷NC	Number of acceptances of personal information per contribution	.17		yes	.23	.13
92	45	SUM	Number of nonacceptances of personal information in the interview	.13	.25	no	--	--
93	45	SUM÷NC	Number of nonacceptances of personal information per contribution	.00		no	--	--
94	46	SUM	Number of agreements with personal information in interview	1.41	.23	no	--	--
95	46	SUM÷NC	Number of agreements with personal information per contribution	.01		no	--	--
96	47	SUM	Number of disagreements with personal information in the interview	.07	.00	no	--	--
97	47	SUM÷NC	Number of disagreements with personal information per contribution	.00		no	--	--

Table 7. (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
98	48	SUM	Number of requests for agreement with personal information in the interview	.94	.35	no	--	--
99	48	SUM÷NC	Number of requests for agreement with personal information per contribution	.01		no	--	--
100[a]	49	SUM	Number of opinions or reasons in the interview	11.79	.47	yes	5.84	5.94
101[b]	49	SUM÷NC	Number of opinions or reasons per contribution	.10		yes	.11	.11
102	50	SUM	Number of requests for opinions or reasons in interview	.56	.10	no	--	--
103	50	SUM÷NC	Number of requests for opinions or reasons per contribution	.01		no	--	--
104	51	SUM	Number of acceptances of opinions or reasons in the interview	5.54	.42	yes	2.97	2.56
105	51	SUM÷NC	Number of acceptances of opinions or reasons per contribution	.05		yes	.06	.05
106	52	SUM	Number of nonacceptances of opinions or reasons in the interview	.06	.00	no	--	--
107	52	SUM÷NC	Number of nonacceptances of opinions or reasons per contribution	.00		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
108[a,b]	53	SUM	Number of agreements with opinions or reasons in the interview	1.49	.30	yes	.79	.69
109	53	SUM÷NC	Number of agreements with opinions or reasons per contribution	.01		yes	.01	.01
110	54	SUM	Number of disagreements with opinions or reasons in the interview	.07	.00	no	--	--
111	54	SUM÷NC	Number of disagreements with opinions or reasons per contribution	.00		no	--	--
112	55	SUM	Number of requests for agreement with opinions or reasons in the interview	.23	.18	no	--	--
113	55	SUM÷NC	Number of requests for agreement with opinions or reasons per contribution	.00		no	--	--
114	56	SUM	Number of suggestions in the interview	4.41	.51	yes	2.89	1.53
115	56	SUM÷NC	Number of suggestions per contribution	.04		yes	.06	.02
116	57	SUM	Number of orders in interview	.86	.60	yes	.43	.43
117[b]	57	SUM÷NC	Number of orders per contribution	.01		yes	.01	.01

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
118	58	SUM	Number of requests for a suggestion or order in interview	.09	.00	no	--	--
119	58	SUM÷NC	Number of requests for a suggestion or order per contribution	.00		no	--	--
120[b]	59	SUM	Number of acceptances of a suggestion or order in the interview	2.10	.45	yes	.87	1.23
121	59	SUM÷NC	Number of acceptances of a suggestion or order per contribution	.02		yes	.01	.03
122	60	SUM	Number of nonacceptances of a suggestion or order in the interview	.09	1.00	no	--	--
123	60	SUM÷NC	Number of nonacceptances of a suggestion or order per contribution	.00		no	--	--
124	61	SUM	Number of agreements with a suggestion or order in the interview	.24	.00	no	--	--
125	61	SUM÷NC	Number of agreements with a suggestion or order per contribution	.00		no	--	--
126	62	SUM	Number of disagreements with a suggestion or order in the interview	.00	1.00	no	--	--
127	62	SUM÷NC	Number of disagreements with a suggestion or order per contribution	.00		no	--	--

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
128	63	SUM	Number of requests for agreement with or acceptance of a suggestion or order in the interview	.16	.00	no	--	--
129	63	SUM÷NC	Number of requests for agreement with or acceptance of a suggestion or order per contribution	.00		no	--	--
130	64	SUM	Number of restatements or paraphrases in the interview	10.34	.46	yes	7.50	2.83
131[a,b]	64	SUM÷NC	Number of restatements or paraphrases per contribution	.09		yes	.16	.05
132	65	SUM	Number of requests for a restatement or paraphrase in the interview	.27	.33	no	--	--
133	65	SUM÷NC	Number of requests for a restatement or paraphrase per contribution	.00		no	--	--
134[b]	66	SUM	Number of acceptances of a restatement or paraphrase in the interview	3.37	.36	yes	.97	2.40
135	66	SUM÷NC	Number of acceptances of a restatement or paraphrase per contribution	.04		yes	.02	.06

Table 7 (con'd)

Variable	Verbal Behavior Category No.	Variable Type	Descriptive Name	Overall Mean	Reliability	Analyzed	Lib. Mean	Req. Mean
136	67	SUM	Number of nonacceptances of a restatement or paraphrase in the interview	.17	.20	no	--	--
137	67	SUM÷NC	Number of nonacceptances of a restatement or paraphrase per contribution	.00		no	--	--
138	68	SUM	Number of requests for agreement with a restatement or paraphrase in the interview	1.26	.13	no	--	--
139	68	SUM÷NC	Number of requests for agreement with a restatement or paraphrase per contribution	.01		no	--	--

C. Analysis of the Relationship Between Librarian's Verbal Behaviors and Requester Satisfaction

The main analysis consisted of running stepwise multiple regressions with the "stepwise" criteria for each of the satisfaction indexes and measures with the 52 verbal behavior variables as potential independent variables in each equation.* In the stepwise process independent variables were added to the regression equation if their p value was $< .50$. They were taken out of the equation if their p value was $> .10$.

The results of the stepwise multiple regression procedures are given in summary form in Tables 8 and 9. All regression equations were highly significant. Sixteen measures of verbal behavior showed a significant relationship ($p < .05$ for 14 measures; $p < .10$ for 2 measures) with the satisfaction indexes (SATINDX1-SATINDX4). The regression equations for the individual satisfaction measures (SATMEAS1-SATMEAS9) include most of the above (12 of the 16) plus 14 additional ones ($p < .05$ for 10 measures; $p < .10$ for 4 measures). Variance explained (R^2) ranged from .25 to .69.

The R^2 values and the p values associated with each independent variable are no doubt inflated to some extent. Since the independent variables in each equation were chosen from a pool of 52 potential contributions, the stepwise multiple regression process capitalizes on chance. However, the p values

*The raw data, descriptive statistics and intercorrelations, for the four indexes of requester satisfaction (SATINDX1-SATINDX4) and the 52 selected measures of librarian verbal behaviors are available upon request. The regression analysis was done with the Statistical Analysis System (SAS), Version 79.3A.

for the equations (and thus for the R^2 values) are very small (most less than .0001).

In short, the analysis identifies a number of librarians' verbal behaviors that are significantly related to requesters' satisfaction. A more detailed discussion of the results is given in the following section.

Table 8. Measures of Verbal Behaviors That Are Significantly Related to Four Satisfaction Indexes (n=51)

Variable	Verbal Behavior Category Number	Descriptive Name	1. Expectations About Search	2. Librarian Understanding	3. Interview as a Task	4. Interview Comfort
26	13	Number of talkovers that took the turn in the interview		(-)		
27**	13	Number of talkovers that took the turn per contribution	(+)	(+)	(+)	
28**	14	Number of talkovers that did not take the turn in interview			(+)	
33**	16	Number of contributions that contained filler words or phrases in the interview		(+)		
41	19	Number of occurrences of finishing the thought of the other per contribution				(-)*
46**	22	Number of statements that the contributor understands the other in the interview			(-)	
47**	22	Number of statements that the contributor understands the other per contribution		(-)		
67**	32	Number of open questions per contribution			(+)	

*All variables have p values of $< .05$ except those marked with an asterisk, which have p values of $< .10$.

**Also significantly related to nine measures of satisfaction (see Table 9).

Table 8 (con'd)

Variable	Verbal Behavior Category Number	Descriptive Name	1. Expectations About Search	2. Librarian Understanding	3. Interview as a Task	4. Interview Comfort
69**	33	Number of closed questions per contribution				(-)
73**	35	Number of statements containing factual information per contribution	(+)*			
74	36	Number of requests for factual information in the interview		(+)		
77**	37	Number of statements containing an acceptance of factual information per contribution	(-)			
91**	44	Number of acceptances of personal information per contribution				(-)
100	49	Number of opinions or reasons in the interview		(+)		
108**	53	Number of agreements with opinions or reasons in the interview	(-)			
131**	64	Number of restatements or paraphrases per contribution		(-)		
		R^2	.37	.69	.42	.33
		p	$<.001$	$<.001$	$<.001$	$<.001$

Table 9. Measures of Verbal Behavior That Are Significantly Related to Nine Measures of Satisfaction (n=51)

Variable	Verbal Behavior Category Number	Verbal Behavior Measure	1. Enjoyed Working with Librarian	2. Very Helpful to Me	3. Satisfied with Interview	4. Librarian Understood Request	5. Successful Interview	6. Expect Search to Be Successful	7. Felt Ill-at-ease	8. Librarian Understood Purpose	9. Fulfilled Expectations
7	5	Proportion of contributions during which a tool was used							(+)		
19	10	Number of contributions which were not silences in the interview								(-)*	
27**	13	Number of talkovers that took the turn per contribution					(+)	(+)			(+)
28**	14	Number of talkovers that did not take the turn in the interview									(+)
29	14	Number of talkovers that did not take the turn per contribution	(+)						(+)	(+)	
33**	16	Number of contributions that contained filler words or phrases in the interview								(+)	
34	16	Number of filler words or phrases per contribution	(-)*	(-)*							
40	19	Number of occurrences of finishing the thought of the other in the interview									(-)

*All variables have p values of $< .05$ except those marked with an asterisk, which have p values of $< .10$.

**Also significantly related to four satisfaction indexes (see Table 8).

Table 9 (con'd)

Variable	Verbal Behavior Category Number	Verbal Behavior Measure	1. Enjoyed Working With Librarian	2. Very Helpful to Me	3. Satisfied with Interview	4. Librarian Understood Request	5. Successful Interview	6. Expect Search to Be Successful	7. Felt Ill-at-ease	8. Librarian Understood Purpose	9. Fulfilled Expectations
46**	22	Number of statements that the contributor understands the other in the interview									(-)
47**	22	Number of statements that the contributor understands the other per contribution								(-)	
66	32	Number of open questions in the interview		(+)							
67**	32	Number of open questions per contribution					(+)*				(+)
69**	33	Number of closed questions per contribution	(-)		(-)*						
71	34	Number of greetings or suggestions in the form of questions per contribution		(+)	(-)						
73**	35	Number of statements containing factual information per contribution	(-)					(+)*			
75	36	Number of requests for factual information per contribution	(-)								
77**	37	Number of statements containing an acceptance of factual information per contribution						(-)			

Table 9 (con'd)

Variable	Verbal Behavior Category Number	Verbal Behavior Measure	1. Enjoyed Working With Librarian	2. Very Helpful to Me	3. Satisfied with Interview	4. Librarian Understood Request	5. Successful Interview	6. Expect Search to Be Successful	7. Felt Ill-at-ease	8. Librarian Understood Purpose	9. Fulfilled Expectations
89	43	Number of requests for personal information per contribution	(+)								
90	44	Number of acceptances of personal information in the interview				(-)					
91**	44	Number of acceptances of personal information per contribution	(-)								
101	49	Number of opinions or reasons per contribution	(+)*								
108**	53	Number of agreements with opinions or reasons in the interview				(+)		(-)			
117	57	Number of orders per contribution							(+*)		
120	59	Number of acceptances of a suggestion or order in the interview				(-)					
131**	64	Number of restatements or paraphrases per contribution				(-)	(-)				
134	66	Number of acceptances of a restatement or paraphrase in the interview		(+)							
		R^2	.54	.35	.33	.52	.31	.37	.25	.61	.43
		p	<.001	<.001	<.001	<.001	<.001	<.001	<.004	<.001	<.001

IV. DISCUSSION

The purpose of this research was to develop a method of describing the verbal behaviors of librarians and requesters that is objective and that will identify verbal behaviors which relate to satisfaction with the interview. The method that was developed is discussed earlier in this report and is described in detail in a separate codebook (Crouch and Lucia, 1981).

The method is inherently objective and descriptive. Coders focus on each "contribution" that each individual makes to the interview. They identify the presence or absence of several categories of verbal behavior in each contribution and count the number of certain items Categories include behaviors such as asking open questions. and giving factual information. Counted were, for instance, numbers of words and numbers of filler words or phrases. They do not make any evaluative judgements about individual contributions or the interview as a whole. Thus, the method describes the verbal behaviors that occur in the interview.

A. Objectivity of the Coding Scheme

How objectively this coding scheme describes verbal behaviors was studied by having two coders independently code 1,585 contributions (ten interviews). Comparisons of their coding are given in detail in Section III.A. Intercoder agreement was sufficiently high for 26 of the 64 categories to allow further analysis. The intercoder agreement

measure* was greater than .70 for five categories and between .40 and .70 for 16 more.

In general, these measures are low. Coding required a great deal of concentration, and remembering the distinctions required by the coding scheme was difficult. Thus, the coding scheme can probably be improved by having coders attend to fewer categories at one time and by clarifying the conceptual definitions of the categories. The former could be accomplished either by reducing the number of categories included in the scheme or by training groups of coders for subsets of the categories. Also, continuous feedback throughout the coding process would sharpen coders' judgements. This could be accomplished by having two coders compare and reconcile their codes on every second, third, or fourth interview as they code.

The meaning of low intercoder reliability is that the description of the interview has error in it. It is in error due to random mistakes of coders and biases that coders bring to the process. However, the two types of error are indistinguishable in the data. Random mistakes, to the extent that they are present, surpress measures of relationship between verbal behaviors and satisfaction, and they make it possible for findings to be due to chance alone. The extent of the latter danger can be assessed with inferential statistics. We just have to live with the former problem. Since intercoder reliabilities are low, we would expect that to some

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*Measure 1 for dichotomous categories; Intercoder Agreement (Correlation) for continuous categories.

unknown extent true relationships would not show up as significant in this study.

Biases present a different kind of problem; they contribute, again to some unknown extent, to spurious findings. Our findings might be unique to the way in which these coders used the coding scheme. Actually, there is little that can be done to guard against this in a single exploratory study. To study coder bias, extensive multiple coding is required, and the expenses can only be justified after a coding scheme has been shown to have promise. Ultimately, the best data to assess coder bias comes from completely independent research terms using the scheme and comparing results.

In this study, coding was done by five coders with two doing most of the interviews--Coder 1 did 24 and Coder 4 did 27 of the 70 interviews coded. Thus, we guarded against one person's biases having an inordinate effect. In addition, the judgements they were asked to make were inherently objective rather than evaluative. It seems reasonable to assume that coder bias is not an overwhelming problem. However, an exact assessment cannot be made until within- and across-study data are gathered.

In summary, intercoder agreement was generally low, but 26 categories were coded reliably enough for further analysis. The low reliabilities suggest that (1) relationships between verbal behaviors and satisfaction may exist, but not be discovered in this study; and (2) coder biases may contribute spuriously to the findings.

B. Relationships Between Verbal Behaviors of Librarians and Requester Satisfaction

A strong relationship was found between librarians' verbal behaviors and requesters' satisfaction with the presearch interview. Thirty-three to 69 percent of the variance in requesters' satisfaction scores can be accounted for by librarians' verbal behaviors. The relationship was assessed by a stepwise multiple regression procedure for each of the four requester satisfaction subscales. The satisfaction subscales are discussed briefly earlier in this report and in detail in another project report (Tessier, 1981). They are, for requesters:

1. positive expectations for search results/ information/problem solution
2. satisfaction with librarian understanding
3. satisfaction with the interview seen as an event
4. interview comfort

Tables 10 and 11 give an overview of the findings. For verbal behaviors 6 through 34 (Table 10), the following information is given:

Column 1 - the overall mean of number of occurrences per interview for all interviews coded (n=70)

Column 2 - the intercoder reliability (Measure 1 for dichotmous categories; Intercoder Agreement (Correlation) for continuous categories)

Column 3 - the results of the regression analysis

Column 3 (con'd)

dropped = not analyzed because the mean and/or inter-coder reliability were too low

nonsig = not significantly related to any requester satisfaction subscale

()()()() = significantly related to the four requester satisfaction subscales:

1. positive expectation re: search results
2. satisfaction with librarian's understanding
3. satisfaction with interview as event
4. interview comfort

One through four is indicated by the position of the parentheses. A "+" in the parentheses indicates a significant positive relationship to the corresponding subscale. A "-" indicates a negative relationship. Empty parentheses indicates a nonsignificant relationship to that subscale.

For verbal behaviors 35 through 68 (Table 11), the same information is presented in a different format. The codebook provides a detailed description of each category of verbal behavior.

Table 10. Summary of Findings for Verbal Behavior Categories 5-34*.

Verbal Behavior Category	Brief Descriptive Name	(1) Overall Mean		(2) Reliability	(3) Results**
5	use of tool by the librarian	39.97		.73	nonsig
6	greeting or polite expression	1.83		.24	dropped
7	name of other (with or without title attached)	.17	very low	1.00	dropped
8	title of other (without name attached)	.00	low	1.00	dropped
9	# of occurrences of "I don't know"	.00	low	1.00	dropped
10	# of words in contribution	1166.67		.97	nonsig
11	topic or subtopic changed	--	--	--	dropped
12	request for permission to change topic	.04	very low	.00	dropped
13	talkover that takes the turn	8.51		.57	(+) (+/-) (+) ()
14	talkover that doesn't take the turn	22.40		.84	() () (+) ()
15	verbal reinforcer	16.10		.71	nonsig

*Note that means and intercoder agreement measures are based on all contributions (librarian, requester, and silences) in all interviews (n=70).

**dropped = not analyzed because the mean and/or intercoder reliability were too low

nonsig = not significantly related to any requester satisfaction subscale

() () () () = significantly related to the four requester satisfaction subscales:

1. positive expectation re: search results
2. satisfaction with librarian's understanding
3. satisfaction with interview as event
4. interview comfort

One through four is indicated by the position of the parentheses. A "+" in the parentheses indicates a significant positive relationship to the corresponding subscale. A "-" indicates a negative relationship. Empty parentheses indicate a nonsignificant relationship to that subscale.

Table 10 (con'd)

Verbal Behavior Category	Brief Descriptive Name	(1) Overall Mean		(2) Reliability	(3) Results
16	# of filler words or phrases	45.31		.72	()(+)()()
17	reciprocated nervous laughter	.66	low	.12	dropped
18	unreciprocated nervous laughter	.96	low	.14	dropped
19	finishing the thought of the other	1.51		.59	()()()(-)
20	evaluative statement about the interview	.76	low	.23	dropped
21	description of what contributor is doing to understand the other	2.17		.17	dropped
22	statement that contributor understands the other	.86	low	.40	()(-)(-)()
23	listing alternative actions for other to choose among	.94	low	.15	dropped
24	statement that the speaker makes the decisions	.44	low	.13	dropped
25	statement that the other makes the decisions	.06	very low	.17	dropped
26	statement that the speaker and the other jointly make the decisions	.07	very low	.50	dropped
27	positive statement about the other	.49	low	.13	dropped
28	negative statement about the other	.03	very low	.00	dropped
29	positive statement about self	.06	very low	.33	dropped
30	negative statement about self	.10	very low	.00	dropped
31	request for clarification of a contribution	.66	low	.20	dropped
32	open question	3.47		.40	()()(+)()
33	closed question	12.63		.62	()()()(-)
34	greetings or suggestion in the form of a question	.84	low	.47	nonsig

Table 11. Summary of Findings for Verbal Behavior Categories 35-68*.

(A) Brief Descriptive Name; Verbal Behavior Category Number; Mean; Intercoder Agreement Measure; and Results:

	Factual Information	Personal Information	Opinion or Reason	Suggestion or Order	Restatement or Paraphrase
Statement of	35 18.80 .53 SG	42 30.07 .71 NS	49 11.79 .47 SG	56 4.41 .51 NS 57 .86 .60 NS	64 10.34 .46 SG
Request for	36 3.35 .51 SG	43 9.94 .65 NS	50 .56 .10 DR	58 .09 .00 DR	65 .27 .33 DR
Acceptance of	37 11.87 .46 SG	44 17.54 .56 SG	51 5.54 .42 NS	59 2.10 .45 NS	66 3.37 .36 NS
Nonacceptance of	38 .30 .13 DR	45 .13 .25 DR	52 .06 .00 DR	60 .09 1.00 DR	67 .17 .20 DR
Aggreement with	39 1.86 .15 DR	46 1.41 .23 DR	53 1.49 .30 SG	61 .24 .00 DR	----------
Disagreement with	40 .14 .00 DR	47 .07 .00 DR	54 .07 .00 DR	62 .00 1.00 DR	----------
Request for agreement with	41 1.33 .07 DR	48 .94 .35 DR	55 .23 .18 DR	63 .16 .00 DR	68 1.26 .13 DR

(B) Brief Descriptive Name; Verbal Behavior Category Number; Categorical Description of the Means as Low or Very Low.

	Factual Information	Persnl. Information	Opinion or Reason	Suggestion or Order	Restmt. or Para.
Statement of	35	42	49	56 57 low	64
Request for	36	43	50 low	58 very low	65 low
Acceptance of	37	44	51	59	66
Nonacceptance of	38 low	45 very low	52 very low	60 very low	67 very low
Agreement with	39	46	53	61 low	-------
Disagreement with	40 very low	47 very low	54 very low	62 very low	-------
Request for agreement with	41	48 low	55 low	63 very low	68

(C) Brief Descriptive Name; Verbal Behavior Category Number; and Results.

	Factual Information	Personal Information	Opinion or Reason	Sugg. or Order	Restatement or Paraphrase
Statement of	35 (+)()()()	42 NS	49 ()(+)()()	56 NS 57 NS	64 ()(-)()()
Request for	36 ()(+)()()	43 NS	50 DR	58 DR	65 DR
Acceptance of	37 (-)()()()	44 ()()()(-)	51 NS	59 NS	66 NS
Nonacceptance of	38 DR	45 DR	52 DR	60 DR	67 DR
Agreement with	39 DR	46 DR	53 (-)()()()	61 DR	----------
Disagreement with	40 DR	47 DR	54 DR	62 DR	----------
Request for agreement with	41 DR	48 DR	55 DR	63 DR	68 DR

*Note that means and intercoder agreement measures are based on all contributions (librarian, requester, and silences) in all interviews (n=70). (DR=dropped; SG=Significant Relationships with Satisfaction Measures; NS=Nonsignificant...)

In this section, the distinction between SUM and SUM/NC has been dropped. Categories of verbal behavior from Table 3 are discussed. The tables in the previous section include the information as to whether it was SUM or SUM+NC that was included in the regression equation. Also, only the subscales are discussed. The analysis of the satisfaction data (Tessier, 1981) identified them as a meaningful way to use the satisfaction data. Regression equations were run for the individual satisfaction measures as well. All but one of the verbal behavior categories associated with the subscales also appeared in the regression equations for the individual measures. Several additional categories also appeared, but it is not clear that their relationship to a single satisfaction measure (rather than a subscale) is meaningful. The tables in the previous section show the categories, but they aren't discussed here.

Some of the results are what might reasonably be expected based on general reference interview literature; others are surprising.

(1) Librarian's Active Involvement in the Interview

In the surprising category might be talkovers (Categories 13 and 14) and filler words or phrases (Category 16). Conventional wisdom has it that those behaviors are undesirable, but they related positively to satisfaction. The more librarians "talked over" the requester and the more filler words and phrases they used, the more satisfied users were.*

*There is a perplexing anomally here. Talkover that takes the turn relates positively to two subscales and both positively and negatively to a third. I do not have an explanation for the discrepancy.

I propose that the reason for the finding is that those behaviors reflect the active involvement of the librarian in the interview. "Giving opinions or reasons" might also be related. Future research should include a more comprehensive assessment of "involvement."

(2) Librarian Expressing Understanding or Acceptance of What the Requester Said

Several verbal behaviors that were negatively related to requester satisfaction seem to express understanding or acceptance of what the requester said. They are:

22. statement that the contributor understands the other
37. acceptance of factual information
44. acceptance of personal information
53. agreement with opinion or reason
64. restatement or paraphrase

For all, we would have expected a positive relationship. The first four generally reflect a positive, supportive relationship between librarian and user. Why, then, don't users find those behaviors satisfying? One impression I have from watching the videotapes of the interviews and listening to the debriefing sessions is that these requesters are highly task-oriented. I was surprised at the extent to which socio-emotional issues were considered unimportant or ignored. Maybe requesters find these verbal behaviors to be diversions or annoyances because they do not move forward the task at hand.

A somewhat analygous analysis can be applied to restatement

and paraphrase (Var. 64). Those techniques are generally recommended to improve the fidelity of the information transmitted. They may accomplish that goal, in fact, but be perceived by requesters as diversions or annoyances. That is, they keep the requester from continuing with his explanation of his information need.

(3) Open Versus Closed Questions

Not surprising are the findings that open questions are positively related to satisfaction, whereas closed questions are negatively related. Open questions allow the requester to express himself in his own terms; closed questions box him in. The latter may be the most efficient way to get some kinds of information, but these findings suggest that requesters find them discomforting.

(4) Factual Versus Personal Information

Table 11 shows the distinction between factual and personal information which was incorporated into the coding scheme because it seemed to reflect an important difference in the way in which topics were discussed. "Factual" refers to information about a topic that is not related to the interviewer or interviewee. "Personal" refers to information that is related to one of the interactants. For instance,

--"How does that drug affect heart rate?" is a request for factual information.

--"Are you concerned with the effect of that drug on heart rate?" is a request for personal information.

--"Tissue rejection is getting lots of attention by biochemists." is factual information.

--"I will be studying tissue rejection." is personal information.

These findings neither confirm nor deny the importance of the distinction. Statements of factual information by the librarian and requests for factual information addressed to the requester were both positively related to requester satisfaction. The comparable categories for personal information were not significantly related to satisfaction. Further analysis of requester verbal behaviors or composite variables such as the ratio of factual to personal information is needed.

(5) Verbal Behaviors That Seldom Occurred

Many verbal behaviors that were included in the coding scheme seldom occurred in the interviews. All "disagreement with" and "non-acceptance of" categories, for instance, occurred less than once per interview and most less than once in five interviews. (The "low" and "very low" labels in Tables 10 and 11 are based on cutoff values of 1.00 and .20, respectively.) Positive and negative statements about self and other by the librarian were also very infrequent. The task emphasis mentioned earlier seems also to be reflected here; many categories related to socio-emotional concerns are among the low and very low. Future use of this coding scheme can leave some of these infrequent behaviors out, thus simplifying the coding task.

C. Limitations of this Study and Suggestions for Further Research

Limitations of this study fall into three major groups: exploratory rather than definitive data analysis, low intercoder reliabilities, and a somewhat artificial situation for gathering data.

The study was exploratory and met its goals of developing a coding scheme, assessing its objectivity, and identifying verbal behaviors that are associated with requester satisfaction. However, the richness of the coding scheme exceeds the analysis possible within the study. Nineteen additional cases are available for analysis, and for all cases, there is data on requester verbal behaviors and librarian satisfaction. Further, more definitive, analysis is warranted based on these findings.

Intercoder reliabilities were sufficiently high to allow important verbal behaviors to be identified, but they are too low. Measures of the relationship between some verbal behaviors and satisfaction may be suppressed. Future research should revise the coding scheme and procedures to insure higher reliability.

Finally, a limitation which is most difficult to overcome--the interviews studied were affected by the presence of a videotape camera and the researchers. As discussed in other reports of the project, the librarians were obviously highly motivated to do their best in these interviews, many were somewhat nervous and self-conscious, and requesters saw these

interviews as special events, somewhat out of the ordinary for the library. These effects are real; however, I think it would be unfortunate if their influence was over-emphasized. The librarians were carrying out a well-practiced procedure. I believe they felt a great obligation to provide useful searches, as always. Although there are no doubt differences between the interviews we have on videotape and interviews that ocur naturally in medical libraries, the similarities are probably more pronounced than the differences. Other research needs to test the findings of this kind of obtrusive research in more unobtrusive ways. This research provides numerous pointers of what to look for.

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(See also the List of Presearch Interview Project Reports on the back cover of this report.)

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LIST OF REPORTS OF
THE PRESEARCH INTERVIEW PROJECT
(NLM Grant No. 1 R01 LM03074-01)

Date	Title	Author(s)
Feb. 1, 1980	Progress Report for May 1, 1979 to January 15, 1980	Crouch and Atherton
March 7, 1980	Codebook and Frequency Distributions for Quantifiable Data	Tessier and Fargnoli
July 4, 1980	Analysis of Verbal Behaviors in the Presearch Interview: Codebook with Instructions for Transcribing Interviews	Crouch and Lucia
April 1981	Descriptive Account of Stimulated Recall Sessions with Requesters that Followed Presearch Interviews	Wargula, Lucia, and Fargnoli
April 1981	Satisfaction Measures in Presearch Interviews	Tessier
April 1981	Verbal Behaviors of Librarians in Presearch Interviews	Crouch
April 1981	Nonverbal Behaviors in Presearch Interviews	Genova
April 1981	Tasks Performed by Online Searchers in Presearch Interviews	Cochrane
May 1981	Executive Summary, Project Bibliography, and Sample Data	Cochrane

Appendix E. Stepwise Multiple Regression Models Relating Measures of Verbal Behaviors to Four Satisfaction Indexes (n=51)

(1) Stepwise Regression Procedure for Dependent Variable SATINDX1

STEP	VARIABLE			R SQUARED=
1		VBEH 077	Entered	0.110
2		VBEH 027	Entered	0.214
3		VBEH 108	Entered	0.320
4		VBEH 073	Entered	0.372
5		VBEH 091	Entered	0.397
6		VBEH 091	Removed	0.372

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	4	29.14	7.28	6.84	0.0002
ERROR	6	49.00	1.06		
TOTAL	50	78.15			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	5.05				
VBEH027	11.53	3.34	12.65	11.87	0.0012
VBEH073	2.80	1.43	4.06	3.81	0.0570
VBEH077	-5.95	1.80	11.57	10.86	0.0019
VBEH108	-0.23	0.07	9.41	8.84	0.0047

(2) Stepwise Regression Procedure for Dependent Variable SATINDX2

STEP	VARIABLE			R SQUARED=
1		VBEH 047	Entered	0.274
2		VBEH 120	Entered	0.385
3		VBEH 100	Entered	0.462
4		VBEH 131	Entered	0.509
5		VBEH 027	Entered	0.563
6		VBEH 026	Entered	0.619
7		VBEH 033	Entered	0.665
8		VBEH 120	Removed	0.661
9		VBEH 74	Entered	0.699
10		VBEH 108	Entered	0.714
11		VBEH 108	Removed	0.699

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	7	31.62937872	4.51848267	14.27	0.0001
ERROR	43	13.61571932	0.31664464		
TOTAL	50	45.24509804			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	5.98				
VBEH026	-0.19	0.02	14.47	45.72	0.0001
VBEH027	12.19	2.31	8.81	27.84	0.0001
VBEH033	0.03	0.01	2.58	8.17	0.0065
VBEH047	-14.92	4.37	3.68	11.62	0.0014
VBEH074	0.07	0.03	1.68	5.33	0.0258
VBEH100	0.06	0.01	3.87	12.24	0.0011
VBEH131	-3.48	1.06	3.41	10.77	0.0020

Appendix E (con'd)

(3) Stepwise Regression Procedure for Dependent Variable SATINDX3

STEP 1	VARIABLE	VBEH 027	Entered	R SQUARED=0.131
2		VBEH 046	Entered	0.281
3		VBEH 067	Entered	0.355
4		VBEH 028	Entered	0.423
5		VBEH 101	Entered	0.455
6		VBEH 101	Removed	0.423

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	4	15.12219682	3.78054921	8.43	0.0001
ERROR	46	20.62290122	0.44832394		
TOTAL	50	35.74509804			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	5.52				
VBEH027	7.11	2.16	4.84	10.81	0.0019
VBEH028	0.02	0.00	2.40	5.36	0.0251
VBEH046	-0.63	0.14	8.93	19.94	0.0001
VBEH067	3.60	2.12	4.31	9.63	0.0033

(4) Stepwise Regression Procedure for Dependent Variable SATINDX4

STEP 1	VARIABLE	VBEH 091	Entered	R SQUARED=0.189
2		VBEH 069	Entered	0.289
3		VBEH 041	Entered	0.338
4		VBEH 105	Entered	0.375
5		VBEH 105	Removed	0.338

	DF	SUM OF SQUARES	MEAN SQUARE	F	PROB>F
REGRESSION	3	14.11342296	4.70447432	8.02	0.0002
ERROR	47	27.57285155	0.58665642		
TOTAL	50	41.68627451			

	B VALUE	STD ERROR	TYPE II SS	F	PROB>F
INTERCEPT	7.93				
VBEH041	-18.24	9.74	2.05	3.51	0.0673
VBEH069	-3.56	1.14	5.67	9.67	0.0032
VBEH091	-2.80	0.86	6.19	10.56	0.0021